

Remarks/Arguments

Claims 1, 11, 21, 25, 37, 39, 51, 53, 57, 58, 60 and 61 have been amended.

A Request for Continued Examination (RCE) and Electronic Funds Transfer payment in the amount of \$790 to cover the RCE filing fee payment are being filed with this Amendment. A Petition for 2-Months Extension of Time with a fee in the amount of \$450.00 by Electronic Funds Transfer area also being filed with this Amendment. Authorization is granted to charge our deposit account no. 03-3415 for any additional fees necessary for entry of this Amendment.

The Examiner has rejected applicants' claims 1, 7-11, 17-21, 24-28, 31-37, 39-41, 45-51, 53, 57-58 and 60-61 under 35 USC 103(a) as being unpatentable over the Black patent (U.S. Pat. No. 6,307,956) in view of the Yguerabide, et al. patent (U.S. Pat. No. 6,586,193) in further view of the Schmidt, et al. patent (U.S. Pat. No. 7,094,531) or the Lockhart, et al. patent (U.S. Pat. No. 6,344,316). Applicants have amended applicants' independent claims 1, 11, 21, 25, 37, 39, 51, 53, 57, 58, 60 and 61 and with respect to these claims, and their respective dependent claims, the Examiner's rejections are respectfully traversed.

Applicants' independent claim 1 has been amended to recite a system for issuing an authentication certificate used in personal authentication, comprising a DNA extractor for obtaining a gene from a given person, reaction means for reacting a DNA array in which a plurality of DNA probes corresponding to plural kinds of genes are arranged in a predetermined order, with the gene obtained by the DNA extractor, storage means for registering the hybridization pattern obtained by the reaction means in association with type information specifying a probe layout of the DNA array used for obtaining the hybridization pattern, issuing means for issuing an authentication certificate for certifying the person and

controlling means for executing a process comprising the steps of making the reaction means react the DNA array with a gene obtained from the given person to form a hybridization pattern, and making the issuing means issue an authentication certificate by attaching the reacted DNA array obtained in the step (i) to a base of the authentication certificate, wherein an authentication is realized by comparing the hybridization pattern subjected to the authentication and type information of a DNA array with the registered hybridization pattern of a given person and corresponding type information. Applicants' independent claims 11 and 21 have been similarly amended.

Applicants have amended applicants' independent claim 25 to recite a storage means for storing registration information which includes layout information representing a hybridized pattern of reacted DNA array and type information specifying a probe layout of the reacted DNA array. Applicants' independent claims 39 and 57 have been amended to recite similar features. Applicants have further amended applicants' claim 25 to recite generating authentication information on the basis of the layout information acquired by the acquisition means and type information specifying a probe layout of DNA array used in the acquisition means. Applicants' independent claims 37, 39, 51, 57 and 58 have been similarly amended.

Applicants have amended applicants' independent claim 53 to recite an authentication certificate used to authenticate a given person, comprising a base and a reacted DNA array attached to the base, wherein the authentication certificate is issued by an apparatus comprising a reaction unit adapted to, in order to generate the reacted DNA array, react a DNA array in which a plurality of DNA probes corresponding to plural kinds of genes are arranged in a predetermined order, with a gene obtained from a given person to form a

hybridization pattern, a registering unit adapted to register the hybridization pattern formed by the reaction unit in association with type information specifying a probe layout of the DNA array used for forming the hybridization pattern, and an issuing unit adapted to issue an authentication certificate for certifying the person by attaching the reacted DNA array obtained by the reaction unit to a base of the authentication certificate, wherein an authentication is realized by comparing hybridization pattern subjected to the authentication and type information of a DNA array with the registered hybridization pattern of a given person and corresponding type information.

Applicants have also amended applicants' independent claim 60 to recite registering the hybridization pattern formed by the reaction means and type information specifying an order of DNA probes of the selected DNA array and applicants' independent 61 to recite registering type information regarding the order of the DNA probes of the DNA array selected in step (i) in association with the first hybridization pattern.

The features of amended independent claims 1, 11, 21, 25, 37, 39, 51, 53, 57, 58, 60 and 61 are disclosed in applicants' specification on page 22, line 19 to page 23, line 10 and page 36, lines 1-12.

The constructions recited in applicants' amended independent claims 1, 11, 21, 25, 37, 39, 51, 53, 57, 58, 60 and 61 are not taught or suggested by the cited art of record. In particular, applicants' amended independent claims 1, 11, 21, 25, 37, 39, 51, 53, 57, 58, 60 and 61 are characterized by using an authentication certificate on which a reacted DNA array obtained by reacting a DNA array with a gene from a given person, or a hybridization pattern of the reacted DNA, is attached. Applicants' amended independent claims 1, 11, 21, 25, 37, 39, 51, 53, 57, 58, 60 and 61 are also characterized by using the hybridization pattern of the

reacted DNA and type information specifying a probe layout or order of the DNA array in authenticating a user. Applicants believe that these features are not disclosed or suggested by the cited art of record.

In the Final Office Action of October 12, 2006, the Examiner has acknowledged that neither the Black patent and the Yguerabide patent disclose attaching a reacted DNA array to a base of the authentication certificate. However, the Examiner has argued that the Schmidt, et al. (at col. 3, lines 21-31) and the Lockhart (at col. 107, lines 4-12) patents provide such a disclosure.

Applicants have reviewed the Schmidt, et al. and the Lockhart, et al. patents and believe that there is no teaching or suggestion in these references of attaching a reacted DNA array or a hybridization pattern of the reacted DNA array to the authentication certificate. In particular, the Schmidt, et al. patent discloses a method of sequencing a single-stranded DNA molecule by ligating hybridization probes, each of which includes an identifying label or tag, to a DNA primer and then determining the sequence of the DNA primer based on the identity of the labels or tags carried by the probes hybridized with the DNA primer. See col. 1, lines 30-47, col. 2, lines 26-45; col. 3, lines 21-31 and col. 4, lines 10-21. Thus, Schmidt, et al. only discloses reacting the DNA primer with hybridization probes that have labels or tags attached thereto, to produce a reacted DNA array, i.e. the hybridized DNA primer with probes. There is no mention in the Schmidt, et al. patent of an authentication certificate, or of attaching the reacted DNA array, produced by reacting the DNA primer with the hybridization probes, to anything, particularly to an authentication certificate. Likewise, there is no mention in the Schmidt, et al. of attaching the hybridization pattern of the reacted DNA array to an authentication certificate.

Similarly, the Lockhart, et al. patent does not teach or suggest these features. In particular, Lockhart, et al., teaches a method of identifying nucleic acid abundance in one or more DNA samples by hybridizing the DNA sample with one or more probe arrays to produce a reacted DNA array, and determining the hybridization pattern of the reacted DNA array. See, Abstract; col. 16, lines 60-64; col. 20, lines 57-67; col. 21, lines 8-18. Lockhart, et al. further discloses use of labels, such as fluorescent dyes or radiolabels, attached to DNA samples and/or to the probe arrays which are used to identify the DNA samples and/or the probe arrays to which they are attached, so as to determine the hybridization pattern of the reacted DNA array. Thus, like the Schmidt, et al. patent, the Lockhart, et al. patent only teaches use of identifying labels attached to the reaction components to identify the sequence, or the hybridization pattern, of the reacted DNA array, and makes no mention of attaching the reacted DNA array or the hybridization pattern determined from the reacted DNA array to anything. Thus, neither Schmidt, et al. nor the Lockhart, et al. patents teach or disclose attaching the reacted DNA array or the hybridization pattern of the reacted DNA array to an authentication certificate.

Accordingly, applicants' amended independent claims 1, 11, 21, 25, 37, 39, 51, 53, 57, 58, 60 and 61, each of which recites either an authentication certificate for certifying a person to which a reacted DNA array, obtained by reacting a DNA array with a gene from a given person is attached, or an authentication certificate to which a hybridization pattern of the reacted DNA array is attached, and their respective dependent claims, patentably distinguish over the cited Black patent, Yguerabide, et al. patent, the Schmidt, et al. patent and the Lockhart, et al. patent, taken alone or in combination.

Moreover, the cited references fail to teach or suggest using the hybridization pattern of the reacted DNA and type information specifying a probe layout or order of the DNA array for authentication. Specifically, the Black patent cited by the Examiner teaches use of a biometric reference, such as DNA or other biotech, encrypted on a portable device and matched to the corresponding biometric reference of the user, for gaining access into a system. See, col. 7, lines 55-57 and col. 8, lines 37-45. With respect to use of DNA as the biometric reference in authorizing access to the system, Black only teaches that genetic analysis using arrays of immobilized single-stranded DNA probes may be employed. Col. 25, lines 27-25. However, the Black patent does not mention any specific information used for authentication of the user and merely teaches that sequencing techniques may be used for sensing the biometric property of the user.

The cited Yguerabide, et al., Schmidt, et al. and Lockhart, et al. patents are all directed to methods of detection and/or sequencing of DNA molecules, and make no mention of using information obtained through such detection and/or sequencing for authentication of a user to a system. Instead, the Yguerabide, et al. patent discloses use of hybridization of nucleic acid probes with nucleic acid target sequence to determine whether a predetermined nucleic acid sequence is present in a sample. The Schmidt, et al. and the Lockhart, et al. patents both teach determining a sequence of a single-stranded DNA molecule by attaching labeled hybridization probes to the single-stranded DNA molecule and obtaining a hybridization pattern based on the labels of the attached probes. Thus, these cited patents merely disclose determining whether a particular DNA sequence is present in a sample and determining a hybridization pattern of a target DNA molecule, and make no mention or suggestion of using the hybridization pattern together with type information of the DNA array for authentication.

Applicants' amended independent claims 1, 11, 21 and 53, each of which recites authentication being realized by comparing hybridization pattern subjected to the authentication and type information of a DNA array with registered hybridization pattern of a given person and corresponding information, and their respective dependent claims, thus patentably distinguish over the Black, Yguerabide, et al., the Schmidt, et al. and the Lockhart, et al. patents, taken alone or in combination. Applicants' amended independent claims 25, 37, 39, 51, 57, and 58, which recite generating authentication information on the basis of the layout information acquired from the hybridization pattern or from the reacted DNA array and type information specifying a probe layout of DNA array used in the acquisition, and their respective dependent claims, also patentably distinguish over the Black, Yguerabide, et al., the Schmidt, et al. and the Lockhart, et al. patents. Finally, applicants' amended independent claims 60 and 61, which recite registering the hybridization pattern formed by reacting a DNA array with a gene of a given person and type information specifying an order of DNA probes of the selected DNA array as part of an authentication method or system, also patentably distinguish over the cited Black, Yguerabide, et al., the Schmidt, et al. and the Lockhart, et al. patents.

In view of the above, it is submitted that applicants' claims, as amended, patentably distinguish over the cited art of record. Accordingly, reconsideration of the claims is respectfully requested.

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